

REMARKS

Claims 1-2, 4-13, 15, 16, 18-26, 28-31, and 33-48 are pending in the present application. In the Final Office Action mailed October 4, 2006, the Examiner took the following action: (1) rejected claims 1-2, 4, 6, 8-12, 15, 16, 18, 20, 22-25, 28-31, 33, 35-40 under 35 U.S.C. §102(b) as being anticipated by Cable (U.S. 4,570,542); (2) rejected claims 7, 21, and 43-48 under 35 U.S.C. §103(a) as being unpatentable in view of Cable; and (3) rejected claims 1, 2, 4-7, 10, 13, 15, 16, 18-20, 26, 28-31, 33, 34, 36, and 38-42 under 35 U.S.C. §103(a) as being unpatentable in view of Adams (U.S. 3,627,436). Applicants respectfully request reconsideration of the application in view of the foregoing amendments and the following remarks.

I. Rejections under 35 U.S.C. §102(b) and §103(a)

Claims 1-2 and 4-13

As amended, claim 1 recites an apparatus for supporting a manufacturing tool relative to a workpiece, the apparatus comprising a track assembly configured to be attached to the workpiece and including at least one rail, *the rail including an elongated, substantially smooth surface* having a longitudinally-extending neutral axis and a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack comprises a plurality of tapered apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack*; and a carriage comprising an x-axis portion moveably coupled to the track assembly and moveable relative to the workpiece along the rail, *the carriage including a drive gear having a plurality of drive teeth, the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear*

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rollably engages the rack, the carriage further comprising a y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately coplanar with the substantially smooth surface of the rail of the track assembly. (emphasis added).

Cable (U.S. 4,570,542)

In relevant part, Cable teaches a ribbon drive rail 10 having a base strip 18 and a corrugated strip 19 bonded to the base strip 18 at successive valleys of the corrugations. (2:52-59; Fig. 1). A drive gear 24 engages corrugations 22 of the corrugated strip 19 to drive a machine 11 along the rail 10. (3:1-4).

Cable fails to disclose, teach, or fairly suggest the apparatus recited in claim 1. Specifically, Cable fails to teach or fairly suggest an apparatus that includes “at least one rail, *the rail including an elongated, substantially smooth surface* having a longitudinally-extending neutral axis and a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack comprises a plurality of tapered apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack ... the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack.*” (emphasis added). According to Cable, the drive gear 24 engages the corrugated strip 19 to drive the machine 11 along the rail 10. (3:1-4). There is no teaching or suggestion in Cable of a rack comprising a *plurality of tapered apertures disposed within the substantially smooth surface*, or wherein *the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack* as recited in claim 1.

Cable also fails to teach or fairly suggest an apparatus that includes a carriage having an x-axis portion and *a y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly.* (emphasis added). According to Cable, the machine 11 is driven along the length of the rail 10. There is no teaching or suggestion in Cable of *a y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly* as recited in claim 1.

Adams (U.S. 3,627,436)

In relevant part, Adams teaches an apparatus that includes a track 11 mounted to a workpiece 12, the track 11 having a plurality of positioning slots 157 disposed therein. (3:5-12). The positioning slots 157 are distributed along the track 11 “at precisely the spacing selected for the row of holes to be drilled in the workpiece 12.” (8:70-71; 11:37-40). In operation, an actuator 21 acts between two reciprocating latching mechanisms 20, 24 to successively engage and disengage the reciprocating latching mechanisms 20, 24 into and out of engagement with the slots 157, thereby alternately stepping a drill unit 17 and a clamping unit 22, respectively, along the length of the track 11. (3:35-37; 2:1-14).

Adams does not disclose, teach, or fairly suggest the apparatus recited in claim 1. Specifically, Adams does not teach or suggest an apparatus that includes “at least one rail, *the rail including an elongated, substantially smooth surface* having a longitudinally-extending neutral axis and a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack comprises a plurality of tapered*

apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack ... the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack." (emphasis added). According to Adams, the positioning slots 157 are spaced based upon the desired spacing of drill holes to be formed in the workpiece 12. (8:70-71). Furthermore, the slots 157 of Adams are not *configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack*, but rather, are configured to receive the reciprocating latching mechanisms 20, 24. Therefore, there is no teaching or suggestion in Adams of a *plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack* as recited in claim 1.

Furthermore, Adams also fails to teach or fairly suggest an apparatus that includes a carriage having an x-axis portion and a y-axis portion *slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly.* (emphasis added). According to Adams, the drill unit 17 (and clamping unit 22) moved in directions normal to the track 11. There is no teaching or suggestion in Adams of a *y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly* as recited in claim 1.

For the foregoing reasons, claim 1 is allowable over Cable and Adams, either singly or in any properly motivated combination. Claims 2 and 4-13 depend from claim 1 and are allowable over the cited references at least due to their dependencies on claim 1, and also due to additional limitations recited in these claims.

Claims 15-16, 18-26, and 28

Claim 15 contains similar limitations to those described above with respect to claim 1, and by similar reasoning, claim 15 is allowable over the cited references. More specifically, as amended, claim 15 recites an assembly for performing a manufacturing operation on a workpiece, the assembly comprising a track assembly configured to be attached to the workpiece and including a plurality of rails, the rails being spaced apart and oriented approximately parallel, each rail including an elongated, substantially smooth surface having a longitudinally-extending neutral axis, and at least one rail having a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack comprises a plurality of tapered apertures disposed within the substantially smooth surface of the at least one rail, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack*; a carriage comprising an x-axis portion moveably coupled to the track assembly and moveable relative to the workpiece along the rails, the carriage including a drive gear having a plurality of drive teeth, *the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack*, the carriage further comprising a y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, *the y-axis being approximately co-planar with the substantially smooth surface of the at least one rail of the track assembly*, the carriage including a tool support adapted to receive and support a manufacturing tool; and a manufacturing tool coupled to the tool support and configured to be engageable with the workpiece to perform the manufacturing operation on the workpiece. (emphasis added).

As described more fully above, Cable and Adams do not disclose, teach, or suggest the apparatus recited in claim 15. More specifically, Cable and Adams fail to teach or fairly suggest "at least one rail, *the rail including an elongated, substantially smooth surface* having a

longitudinally-extending neutral axis and a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack comprises a plurality of tapered apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack ... the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack.*" (emphasis added). Furthermore, Cable and Adams also fail to teach or fairly suggest an apparatus that includes a carriage having an x-axis portion and "*a y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly.*" (emphasis added).

For the foregoing reasons, claim 15 is allowable over Cable and Adams, either singly or in any properly motivated combination. Claims 16, 18-26, and 28 depend from claim 15 and are allowable over the cited references at least due to their dependencies on claim 15, and also due to additional limitations recited in these claims.

Claims 29-31 and 33-42

Claim 29 contains similar limitations to those described above with respect to claim 1, and by similar reasoning, claim 29 is allowable over the cited references. More specifically, as amended, claim 29 recites a method of performing a manufacturing operation on a workpiece, the method comprising attaching a track assembly to the workpiece, the track assembly including at least one rail including an elongated, substantially smooth surface having a longitudinally-extending neutral axis and a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack comprises a plurality*

of tapered apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack; moveably coupling a carriage to the track assembly, the carriage comprising an x-axis portion moveable relative to the workpiece along the rails, the x-axis portion including a drive gear having a plurality of drive teeth, the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack; slideably coupling a y-axis portion to the x-axis portion of the carriage, wherein the y-axis portion is moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly; moveably supporting a manufacturing tool on the carriage; engaging a drive apparatus with the drive gear; and driving the carriage supporting the manufacturing tool along the track assembly using the drive apparatus. (emphasis added).

As described more fully above, Cable and Adams do not disclose, teach, or suggest the method recited in claim 29. More specifically, Cable and Adams fail to teach or fairly suggest “*wherein the rack comprises a plurality of tapered apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack ... the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack.*” (emphasis added). Furthermore, Cable and Adams also fail to teach or fairly suggest a method that includes a carriage having an x-axis portion and a y-axis portion “*wherein the y-axis portion is moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly.*” (emphasis added).

For the foregoing reasons, claim 29 is allowable over Cable and Adams, either singly or in any properly motivated combination. Claims 30-31 and 33-42 depend from claim 29 and are allowable over the cited references at least due to their dependencies on claim 29, and also due to additional limitations recited in these claims.

Claims 43-45

Similarly, as amended, claim 43 recites an assembly for performing a manufacturing operation on a workpiece, the assembly comprising a track assembly attachable to the workpiece and including a plurality of rails, the rails being spaced apart and oriented approximately parallel, each rail including an elongated, substantially smooth surface having a longitudinally-extending neutral axis and a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack includes a plurality of apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack*; and a carriage comprising an x-axis portion moveably coupled to the track assembly and moveable relative to the workpiece along the rails, the carriage including a drive gear having a plurality of drive teeth, *the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack*, the carriage further comprising a y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, *the y-axis being approximately co-planar with the substantially smooth surface of the rail of the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly*; the carriage including a manufacturing tool that performs the manufacturing operation on the workpiece, and a drive assembly having at least one rotatable drive gear that includes a plurality of outwardly-projecting

teeth configured to fittingly engage the plurality of apertures as the drive gear is rotated, the drive gear moving the carriage along the track assembly as the drive gear is rotated. (emphasis added).

As described more fully above, Cable and Adams do not disclose, teach, or suggest the apparatus recited in claim 43. More specifically, Cable and Adams fail to teach or fairly suggest “at least one rail, *the rail including an elongated, substantially smooth surface* having a longitudinally-extending neutral axis and a rack extending along a pitch line that at least approximately coincides with the longitudinally-extending neutral axis, *wherein the rack comprises a plurality of tapered apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack ... the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack.*” (emphasis added). Furthermore, Cable and Adams also fail to teach or fairly suggest an apparatus that includes a carriage having an x-axis portion and “*a y-axis portion slideably coupled to the x-axis portion and moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly.*” (emphasis added).

For the foregoing reasons, claim 43 is allowable over Cable and Adams, either singly or in any properly motivated combination. Claims 44-45 depend from claim 43 and are allowable over the cited references at least due to their dependencies on claim 43, and also due to additional limitations recited in these claims.

Claims 46-48

Claim 46 contains similar limitations to those described above with respect to claim 1, and by similar reasoning, claim 46 is allowable over the cited references. More specifically, as amended, claim 46 recites a method of performing a manufacturing operation on a workpiece, the method comprising attaching a track assembly to the workpiece, the track assembly including a plurality of rails, the rails being spaced apart and oriented approximately parallel, each rail including an elongated, substantially smooth surface having a longitudinally-extending neutral axis and at least one rail having a rack extending along a pitch line that at least approximately coincides with its longitudinally-extending neutral axis, *wherein the rack includes a plurality of apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack*; moveably coupling a carriage to the track assembly, the carriage comprising an x-axis portion moveable relative to the workpiece along the rails, the x-axis portion including a drive gear having a plurality of drive teeth, *the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack*; slideably coupling a y-axis portion to the x-axis portion of the carriage, *wherein the y-axis portion is moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly*; moveably supporting a manufacturing tool on the carriage; engaging a drive assembly with the rack, the drive assembly having at least one rotatable drive gear that includes a plurality of outwardly-projecting teeth configured to fittingly engage the plurality of apertures as the drive gear is rotated; and driving the carriage along the track assembly including rotating the drive gear. (emphasis added).

As described more fully above, Cable and Adams do not disclose, teach, or suggest the method recited in claim 49. More specifically, Cable and Adams fail to teach or fairly suggest

“wherein the rack comprises a plurality of tapered apertures disposed within the substantially smooth surface, the plurality of tapered apertures being uniformly spaced along the longitudinally-extending neutral axis of the rack ... the plurality of tapered apertures being configured and spaced to fittingly receive one or more of the plurality of drive teeth as the drive gear rollably engages the rack.” (emphasis added). Furthermore, Cable and Adams also fail to teach or fairly suggest a method that includes a carriage having an x-axis portion and a y-axis portion *“wherein the y-axis portion is moveable with respect to the x-axis portion along a y-axis oriented transversely to the longitudinally-extending neutral axis, the y-axis being approximately co-planar with the substantially smooth surface of the rail of the track assembly.”* (emphasis added).

For the foregoing reasons, claim 46 is allowable over Cable and Adams, either singly or in any properly motivated combination. Claims 47-48 depend from claim 46 and are allowable over the cited references at least due to their dependencies on claim 46, and also due to additional limitations recited in these claims.

CONCLUSION

Applicants respectfully submit pending claims 1-2, 4-16, 18-31, and 33-48 are now in condition for allowance. If there are any remaining matters that may be handled by telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

Respectfully Submitted,

Dated: Dec. 4, 2006

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